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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,353	04/02/2004	James B.Y. Tsui	AFD 672	9868
26902 7590 08/03/2007 DEPARTMENT OF THE AIR FORCE AFMC LO/JAZ 2240 B ST., RM. 100 WRIGHT-PATTERSON AFB, OH 45433-7109			EXAMINER DO, CHAT C	
			ART UNIT 2193	PAPER NUMBER
			MAIL DATE 08/03/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/816,353

Applicant(s)

TSUI ET AL.

Examiner

Chat C. Do

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04/02/2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>04/02/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 14-15 are objected to because of the following informalities:

Re claims 14-15, the applicant is reminded that claims 14-15 are not existed in the application.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-4, 6-10, 12-13, and 16-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-4, 6-10, 12-13, and 16-20 cite a method and apparatus for analyzing input signals in accordance with a mathematical algorithm. In order for claims to be statutory, claims must either include a practical/physical application or a concrete, useful, and tangible result. However, claims 1-4, 6-10, 12-13, and 16-20 merely disclose steps/components for analyzing input signals without further disclosing a practical/physical application or a useful and tangible result since the claims appear to preempt every substantial practical application of the idea embodied by the claim and there is no cited limitation in the claims that breathes sufficient life and meaning into the preamble so as to limit it to a particular practical application rather than being so broad

and sweeping as to cover every substantial practical application of the idea embodied therein. Therefore, claims 1-4, 6-10, 12-13, and 16-20 are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by White (U.S. 5,233,551).

Re claim 20, White discloses in Figures 4-15 the approximated digitized Fourier transformation Kernel function receiver (e.g. abstract as FFT processing device) having: digitized approximated Kernel function value locations disposed adjacent a Kernel function map circle (e.g. Figure 5 and 8 wherein the Kernel function value locations are spread equally over the circle); said Kernel function map circle being of radius dimension expressible as a power of two units along an arbitrary measurement scale, a radius dimension having a length from the numerical series of 1, 2, 4, 8, 16 and so-on units along said arbitrary measurement scale (e.g. Figures 5 and 8 wherein the radius is set to one); shift and add multiplication-susceptible integral unit lengths for each real and imaginary component of digitized Kernel function points in said Kernel function map (e.g. col. 4 lines 3-15 wherein the shift-add is utilizing in-place of multiplication for

reducing complexity); substantially symmetrical digitized Kernel function point angular locations around said Kernel function map circle (e.g. Figure 8 wherein the weight/function points are located symmetrically along axis); digitized Kernel function point locations adjacent said Kernel function map circle being substantially optimized for shift multiplication algorithm implementation (e.g. col. 4 lines 3-15 wherein canonical operation is applied to optimize multiplication-less); and digitized Kernel function point locations adjacent said Kernel function map circle being substantially optimized for minimal approximation Kernel function spurious response generation with respect to adjacent possible approximation Kernel function locations (e.g. abstract and Figures 5-8, and col. 15 lines 10-20).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-2, 5, 8-13, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (U.S. 5,233,551) in view of Tsui et al. (U.S. 5,963,164).

Re claim 1, White discloses in Figures 4-15 the limited mechanization complexity method of analyzing input frequency signals (e.g. X as input into FFT), said method comprising the steps of: generating an approximation Fourier transformation of successive segments of said input frequency signals (e.g. expression 1 in column 6); said

approximation Fourier transformation segments including individual Fourier series terms having real magnitude and imaginary magnitude coefficients generated by multiplication of input signal determined coefficients by selected approximated Fourier transformation Kernel function coefficients (e.g. Figure 8 with Kernel function coefficients and col. 8 lines 50-62); said selected approximated Fourier transformation Kernel function coefficients including both integral unit and integral multiple unit possible component magnitudes over a real and imaginary value complex plane grid and defining a circular trajectory Kernel function location pattern over said real and imaginary value complex plane grid (e.g. Figure 8 as complex grid plane with horizontal axis is real correspondent and vertical axis is imaginary correspondent); said selected approximated Fourier transformation Kernel function locations being dispersed in substantially equal angular increments around said defined circular trajectory Kernel function location pattern on said real and imaginary value complex plane grid (e.g. Figures 5 and 8 wherein each point is located equally along the circle with an angle is determined by a cycle over total number of coefficients); generating said individual Fourier series terms from said input signal determined coefficients and from said Fourier transformation Kernel function coefficients having real magnitude and imaginary magnitude coefficients using a bit shift multiplication algorithm inclusive of multiple shift and add/subtract algorithm components (e.g. Figure 8 and col. 4 lines 3-15 wherein the multiplication is replace with shift-add for reducing complexity); said selected approximated Fourier transformation Kernel function locations being dispersed in an annular space inclusive of said circular trajectory on said real and imaginary value complex plane grid and being optimized with

respect to including integral numeric values compatible with said bit shift multiplication algorithm having multiple shift and add/subtract algorithm components (e.g. col. 4 lines 3-15 and abstract and Figures 5-8, and col. 15 lines 10-20). White fails to disclose in Figures 5-15 that the signal is radio frequency signals. However, Tsui et al. disclose in Figure 2 the FFT is applied to radio frequency signals (e.g. abstract). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to applied the FT to radio frequency signals as seen in Tsui et al.'s invention into White's invention because it would enable to detecting and identifying incoming signal from gigahertz radio frequency range (e.g. abstract and col. 2 lines 17-28).

Re claim 2, White further discloses in Figures 4-15 selected approximated Fourier transformation Kernel function locations are also optimized with respect to generation of minimal spurious responses in said Fourier transformation (e.g. Figure 8).

Re claim 5, White fails to disclose in Figures 4-15 method of analyzing comprises determining input signal component frequency and component amplitude contents of radio frequency input signals of an electronic warfare radio receiver. However, Tsui et al. discloses in Figure 2 determining input signal component frequency and component amplitude contents of radio frequency input signals of an electronic warfare radio receiver (e.g. Figure 10). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made determining input signal component frequency and component amplitude contents of radio frequency input signals of an electronic warfare radio receiver as seen in Tsui et al.'s invention into White's

invention because it would enable to detecting and identifying incoming signal from gigahertz radio frequency range (e.g. abstract and col. 2 lines 17-28).

Re claim 8, White further discloses in Figures 4-15 selected approximated Fourier transformation Kernel function locations are between thirty two and two hundred fifty six in number (e.g. dependent on the need of radix-size wherein an illustration of radix-12 is disclosed in Figure 8).

Re claim 9, White further discloses in Figures 4-15 selected approximated Fourier transformation Kernel function locations are equally and symmetrically disposed in four quadrants of said complex plane grid (e.g. Figures 5 and 8 wherein the point locations are symmetric along the axis).

Re claim 10, it has similar limitations cited in claim 1. Thus, claim 10 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 11, it has similar limitations cited in claim 5. Thus, claim 11 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 12, White further discloses in Figures 4-15 source of multiple frequency signals comprises radio frequency signals of two differing operating frequencies (e.g. inherently since any non-period signal having at least two frequencies or above).

Re claim 13, White further discloses in Figures 4-15 selected plurality of approximated Fourier transformation Kernel function locations disposed within a complex plane plot of real and imaginary values received within an annular arc of selected radial thickness overlying said plot of real and imaginary values are disposed in a closed circular annular arc (e.g. Figures 5 and 8).

Re claim 16, White further discloses in Figures 4-15 complex plane plot of real and imaginary values includes coordinate lengths of 1, 2, 4, 8, 16 and so-on units magnitude (e.g. Figure 8 wherein the magnitude is set to 1).

Re claim 17, White further discloses in Figures 4-15 complex plane plot of real and imaginary values is comprised of integral lengths, along said real and imaginary axes, enabling algorithm implementation with simple shift and add multiplication operations (e.g. Figure 8 and col. 4 lines 3-15 wherein the multiplication is replace with shift-add for reducing complexity).

Re claim 18, White further discloses in Figures 4-15 complex plane plot of real and imaginary values is comprised of integral lengths along said real and imaginary axes defining substantial angular symmetry of Kernel function locations about an origin of said complex plane plot (e.g. Figures 5 and 8 wherein the point locations are symmetrically arrange respect to the axis).

Re claim 19, it is a radio receiver claim having similar limitations cited in claim 1. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 6,757,326 to Prieto et al. disclose a method and apparatus for implementing wavelet filters in a digital system.

Art Unit: 2193

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

July 25, 2007

A handwritten signature in black ink, appearing to be 'Chat C. Do', written in a cursive style.